

CLAIMS

What is claimed is:

1. A vessel device, comprising:
 - a) an inner layer forming a substantial enclosure and including a chemically inert material;
 - b) an intermediate layer, mechanically attached to the inner layer; and
 - c) an outer layer, bonded to the intermediate layer, and surrounding at least a portion of the inner layer.
2. A device in accordance with claim 1, wherein the outer layer is a reinforcement layer and includes fiber in a resin matrix.
3. A device in accordance with claim 1, wherein the intermediate layer includes fibrous material at least partially imbedded in the inner layer.
4. A device in accordance with claim 3, wherein the outer layer includes continuous fiber wound around a perimeter of the vessel.
5. A device in accordance with claim 1, wherein the intermediate layer includes a fabric or mat with fibrous material.
6. A device in accordance with claim 1, wherein the intermediate layer is at least partially imbedded in the inner layer and at least partially bonded to the outer layer.
7. A device in accordance with claim 1, wherein the intermediate layer and the outer layer extend around a perimeter of the substantial enclosure.
8. A vessel device, comprising:
 - a) an inner layer forming a substantial enclosure;
 - b) the inner layer including a chemically inert material;
 - c) a bondable layer, coupled to the inner layer, having an inner portion imbedded in the inner layer and an outer portion exposed and extending beyond the inner layer; and
 - d) another item, bonded to the bondable layer.

9. A device in accordance with claim 8, wherein the another item includes a reinforcement layer substantially surrounding the substantial enclosure, the reinforcement layer including fiber in a resin matrix.

5 10. A device in accordance with claim 8, wherein the bondable layer includes fibrous material at least partially imbedded in the inner layer.

11. A device in accordance with claim 8, wherein the bondable layer includes a fabric or mat with fibrous material.

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12. A device in accordance with claim 8, wherein the bondable layer extends around a perimeter of the substantial enclosure.

13. A vessel device, comprising:

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- a) a substantial enclosure having an outer surface;
- b) the outer surface including a chemically inert material;
- c) a bondable layer, at least partially imbedded in the outer surface of the substantial enclosure; and
- d) another item, bonded to the bondable layer.

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14. A device in accordance with claim 13, wherein the another item includes a reinforcement layer substantially surrounding the substantial enclosure, the bondable layer including fiber in a resin matrix.

25 15. A device in accordance with claim 13, wherein the bondable layer includes fibrous material at least partially imbedded in the enclosure.

16. A device in accordance with claim 13, wherein the bondable layer includes a fabric or mat with fibrous material.

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17. A device in accordance with claim 13, wherein the bondable layer is at least partially imbedded in the enclosure and at least partially bonded to the another item.

18. A vessel device, comprising:

- a) a substantial enclosure having an outer surface;
- b) a bondable layer, at least partially imbedded in the outer surface of the substantial enclosure; and
- c) a reinforcement layer including fiber in a resin matrix chemically bonded to the bondable layer, and surrounding at least a portion of the substantial enclosure.

19. A method for forming a vessel, comprising the steps of:

- a) disposing a bondable layer against an inner surface of a mold shaped to form a substantial enclosure;
- b) disposing a plastic material into the mold;
- c) heating and pressurizing the plastic material causing the plastic material to conform to the mold to form the substantial enclosure, and causing the plastic material to embed into an exposed portion of the bondable layer;
- d) removing the substantial enclosure with the bondable layer from the mold; and
- e) bonding another item to the bondable layer.

20. A method in accordance with claim 19, wherein the step of disposing a bondable layer includes disposing a bondable layer including fibrous material; and wherein the step of causing the plastic material to embed includes causing the plastic material to embed into the fibrous material.

21. A method in accordance with claim 19, wherein the step of bonding another item to the bondable layer includes bonding a fiber with a resin matrix.

22. A method in accordance with claim 19, wherein the step of disposing a plastic material includes disposing a preform in the mold; and wherein the step of pressurizing includes pressurizing the preform to expand.

23. A method in accordance with claim 19, wherein the step of disposing a plastic material includes disposing a sheet over the mold; and wherein the step of pressurizing includes applying a vacuum to the sheet.

24. A method for forming a vessel, comprising the steps of:

a) disposing a bondable layer against an inner surface of a mold shaped to form a substantial enclosure;

b) introducing a plastic material into the mold and causing the plastic material to conform to the mold to form a substantial enclosure;

5 c) causing the plastic material to embed into an exposed portion of the bondable layer in the mold and attaching the bondable layer to the substantial enclosure; and

d) removing the substantial enclosure with the bondable layer from the mold.

25. A method in accordance with claim 24, wherein the step of disposing an attachment
10 portion of a bondable layer includes disposing a bondable layer including fibrous material; and wherein the step of causing the plastic material to embed includes causing the plastic material to embed into the fibrous material.

26. A method in accordance with claim 24, further comprising the step of:
15 bonding another item to the bondable layer.

27. A method in accordance with claim 26, wherein the step of bonding another item to the bondable layer includes bonding a fiber with a resin matrix.

20 28. A method in accordance with claim 24, wherein the step of introducing a plastic material includes disposing a preform in the mold; and wherein the step of causing the plastic material to embed includes pressurizing the preform to expand.

25 29. A method in accordance with claim 24, wherein the step of introducing a plastic material includes disposing a sheet over the mold; and wherein the step of causing the plastic material to embed includes applying a vacuum to the sheet.